COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

FACULTY RESEARCH TALKS

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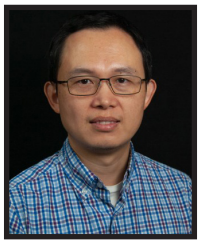
Zoom talk | Friday, April 7, 2023 | Noon to 1 p.m.



PRESENTER 1:
YUANLI BAI
Associate Professor
Mechanical
and Aerospace
Engineering

Mechanics of Biological Materials Including Soft Tissue and Virus

Dr. Bai will present a new research line in the Lab of Solid and Structure Mechanics at MAE on mechanical properties of soft tissues and viruses. In the first part, hyperelastic properties of soft tissue and synthesis tissue were tested to determine the best choice of synthesis tissue for surgery and training/simulation applications, which was supported by the Army Research Lab. The second part of his talk is the mechanical properties of proteins, with a special focus on the SARS-CoV-2 virus. The mechanical properties including nonlinear elasticity, resonant frequencies, and fracture of spike protein and viral shell were studied. One big potential application is to find a mechanical method, for example ultrasound-induced resonant large deformation, to kill coronavirus and other infectious viruses (HIV, or Hep-B, etc.).

Dr. Bai obtained his Ph.D. in mechanical engineering from MIT and his B.S. and M.S. from Tsinghua University. Prior to joining UCF, he was a mechanical engineer at the General Electric Global Research Center in Niskayuna, New York. Dr. Bai leads the Lab of Solid and Structure Mechanics. He received the TIP and RIA awards, as well as the Excellence in Graduate Teaching Award, from CECS. Dr. Bai has graduated one M.S. and nine Ph.D. students at UCF, and has published about 100 papers in his field's most highly-rated journals and conference proceedings.

PRESENTER 2:
YANJIE FU
Assistant Professor
Computer Science

Deep Disruption-Robust Machine Intelligence

Dr. Fu will discuss disruption-robust AI. His team's perspective is to connect methodological and computing issues in major machine learning paradigms, e.g., representation learning (imperfect data, structure knowledge), self-supervised learning (limitation of labels), interactive learning (weak supervision and constrained environments), adaptive learning (uncertain and drifting environment), and stream learning (continuous learning and limitation of memory) as disruption-robust learning. He will discuss how to construct robust data representation to fight data disruptions (imperfect data and complex knowledge structure) and how to construct robust learning strategies to fight machine learning environment disruptions (uncertain and constrained environments). He will include key research insights and present future work.

Dr. Fu is a recipient of NSF CAREER award. His graduated Ph.D. students have joined academia (e.g., University of Macau, Portland State University) as tenure-track faculty members. He is broadly interested in data mining, machine learning and their interdisciplinary applications. His research aims to develop robust machine intelligence with imperfect and complex data by building tools to address framework, algorithmic, data and computing challenges.

PRESENTER 3:
LUIS RABELO
Professor
Industrial Engineering
and Management
Systems

Improving Security, Performance and Efficiency of Emerging Compute Architectures

In this talk, Dr. Rabelo will discuss efforts in the Simulation Interoperability Laboratory to improve parallel distributed and hybrid simulation and their application to increase the organization's efficiency. He will discuss several projects with the government of South Korea, ONR/Lockheed Martin/NASA and the U.S. Space Force, mainly focusing on designing parallel distributed systems (HLA-based) with applications in aerospace.

Dr. Rabelo is the undergraduate director and co-director of the Simulation Interoperability Laboratory. His research interests include hybrid simulation, parallel distributed simulation, AI applied to logistics and supply engineering systems, and agile technological organizational systems. He received his Ph.D. and M.S. from the University of Missouri, both in engineering management. He also has an M.S. in electrical engineering from Florida Tech and a dual master's in systems engineering and management from the MIT School of Engineering and MIT Sloan. Before joining UCF in 2001, he was a senior principal research scientist at Honeywell Laboratories in Minnesota. He has many awards at the international level.

ZOOM LINK: https://bit.ly/3lLqC1l | PREVIOUS TALKS: www.cecs.ucf.edu/faculty-research-talks